Claims:

1. A method for avoiding asynchronous interference in a TDMA (time division multiple access) system allowing communications among a plurality of base stations and mobile stations, comprising the steps of:

at a base station desirous of using a channel to transmit and receive signals,

a) transmitting a first predetermined signal at a slot corresponding to each of transmission and reception timings on the channel to check whether asynchronous interference occurs on the channel;

at a mobile station located in an area where the first predetermined signal can propagate,

b) determining whether asynchronous interference occurs on the channel, based on a plurality of error packet reception results on the channel;

c) when it is determined that asynchronous interference occurs, notifying the base station of occurrence of the asynchronous interference;

at the base station,

d) when the base station is successfully notified of occurrence of the asynchronous interference, determining that asynchronous interference occurs;

e) when receiving at least one error packet on

the channel, determining that asynchronous interference occurs; and

f) when it is determined that asynchronous interference occurs on the channel, selecting another channel to avoid asynchronous interference.

2. A method for avoiding asynchronous interference in a TDMA (time division multiple access) system allowing communications among a plurality of base stations and mobile stations, comprising the steps of:

at a base station desirous of using a channel,

a) transmitting an interference check signal at a slot corresponding to each of transmission and reception timings on the channel to check whether asynchronous interference occurs on the channel;

at a mobile station located in an area where the interference check signal can propagate,

b) determining whether asynchronous interference occurs on the channel, based on a plurality of reception results on the channel;

c) when it is determined that asynchronous interference occurs, transmitting an interference notification signal back to the base station; and

at the base station,

d) when receiving one of the interference notification signal and an error packet as a response to the

interference check signal at a receiving slot on the channel, determining that the channel is not available, and selecting another channel to avoid asynchronous interference.

3. The method according to claim 2, wherein

in the step a), the interference check signal is transmitted a predetermined number of times,

in the step b), it is determined that asynchronous interference occurs on the channel when at least a predetermined number of error packets are included in the plurality of reception results, and

in the step d), it is determined that the channel is not available when at least a predetermined number of error packets have been received on the channel.

4. The method according to claim 2, wherein

in the step a), the interference check signal is transmitted a plurality of times according to a predetermined check signal transmission pattern,

in the step b), it is determined that asynchronous interference occurs on the channel when an error packet reception pattern included in the plurality of reception results matches the predetermined check signal transmission pattern, and

in the step d), it is determined that the channel is not available when at least a predetermined

number of error packets have been received on the channel.

5. The method according to claim 4, wherein the predetermined check signal transmission pattern is to transmit the interference check signal at regular intervals.

6. The method according to claim 4, wherein the predetermined check signal transmission pattern is to transmit the interference check signal at all times but stop transmitting at regular intervals.

7. The method according to claim 4, wherein the predetermined check signal transmission pattern is to transmit the interference check signal at intervals of a time period systematically varying according to a lapse of time.

8. The method according to claim 4, wherein the predetermined check signal transmission pattern is to transmit the interference check signal at all times but stop transmitting at intervals of a time period systematically varying according to a lapse of time.

9. The method according to claim 4, wherein the predetermined check signal transmission pattern is to systematically vary a number of transmitting slots of the

interference check signal and a number of not transmitting slots following the transmitting slots according to a lapse of time.

10. The method according to claim 4, wherein the predetermined check signal transmission pattern is to alternate transmission of the interference check signal for a number of consecutive slots and non-transmission for the same number of consecutive slots.

11. The method according to claim 2, wherein

in the step c), the interference notification signal is transmitted a plurality of times according to a predetermined notification signal transmission pattern, and

in the step d), it is determined that the channel is not available when an error packet reception pattern matches the predetermined notification signal transmission pattern.

12. The method according to claim 11, wherein the predetermined notification signal transmission pattern is to transmit the interference notification signal at regular intervals.

13. The method according to claim 11, wherein the predetermined notification signal transmission pattern is to

transmit the interference notification signal at all times but stop transmitting at regular intervals.

14. The method according to claim 11, wherein the predetermined notification signal transmission pattern is to transmit the interference notification signal at intervals of a time period systematically varying according to a lapse of time.

15. The method according to claim 11, wherein the predetermined notification signal transmission pattern is to transmit the interference notification signal at all times but stop transmitting at intervals of a time period systematically varying according to a lapse of time.

16. The method according to claim 11, wherein the predetermined notification signal transmission pattern is to systematically vary a number of transmitting slots of the interference notification signal and a number of not transmitting slots following the transmitting slots according to a lapse of time.

17. The method according to claim 11, wherein the predetermined notification signal transmission pattern is to alternate transmission of the interference notification signal for a number of consecutive slots and non-

transmission for the same number of consecutive slots.

18. The method according to claim 2, wherein the step d) comprises the steps of:

when receiving an error packet as a response to the interference check signal at the reception timing, synchronizing with a signal received at the reception timing; and

determining whether the signal received at the reception timing is the interference notification signal.

19. The method according to claim 2, wherein

in the step a), the interference check signal is transmitted at all transmitting slots on a carrier including the channel,

in the step d), when receiving one of the interference notification signal and an error packet as a response to the interference check signal at at least one receiving slot on the carrier, determining that asynchronous interference occurs, and another carrier is selected.

20. The method according to claim 2, wherein

in the step a), the interference check signal is transmitted with a minimum transmission power, and

in the step d), when receiving neither the interference notification signal or the error packet, the

steps a) to d) are repeatedly performed while gradually increasing transmission power of the interference check signal.

21. The method according to claim 2, wherein the interference check signal is a non-modulated signal.

22. A mobile communications system using TDMA (time division multiple access) scheme allowing communications among a plurality of base stations and mobile stations, wherein

each of the base stations comprises:

a base communication controller controlling such that, when desiring to use a channel, an interference check signal is transmitted at a slot corresponding to each of transmission and reception timings on the channel; and

a channel controller controlling such that a channel to be used is changed to another channel to avoid asynchronous interference when receiving one of the interference notification signal and an error packet as a response to the interference check signal at a receiving slot on the channel,

each of the mobile stations comprises:

a reception result memory for storing a predetermined number of last packet reception results;

an interference detector for detecting asynchronous

interference on the channel based on the predetermined number of last packet reception results when receiving one of the interference notification signal and an error packet as a response to the interference check signal at a receiving slot on the channel; and

a mobile communication controller controlling such that, when asynchronous interference is detected, an interference notification signal is transmitted back to the base station.

23. The mobile communications system according to claim 22, wherein a last packet reception result indicates one of error status and normal status.

24. The mobile communications system according to claim 23, wherein the last packet reception result of a received packet indicates the error status in one of the cases where no unique word is detected, CRC error is detected, and data of the received packet is not interpretable.

25. The mobile communications system according to claim 22, wherein

the base communication controller transmits the interference check signal a predetermined number of times,

the channel controller determines that the channel is not available when at least a predetermined number of error packets have been received on the channel, and

the interference detector detects asynchronous interference on the channel when at least a predetermined number of error packets are included in the predetermined number of last packet reception results.

26. The mobile communications system according to claim 22, wherein

the base communication controller transmits the interference check signal a plurality of times according to a predetermined check signal transmission pattern,

the channel controller determines that the channel is not available when at least a predetermined number of error packets have been received on the channel, and

the interference detector detects asynchronous interference on the channel when an error packet reception pattern included in the predetermined number of last packet reception results matches the predetermined check signal transmission pattern.

27. The method according to claim 2, wherein an ad hoc network is constructed by one of mobile stations

temporarily acting as a base station.

28. The mobile communications system according to claim 22, wherein an ad hoc network is constructed by one of mobile stations temporarily acting as a base station.